REMARKS

In the present Office Action, claims 2, 4, 6–11, 35, 36 and 40 were examined. Claims 2, 4, 6–11, 35, 36 and 40 stand rejected and no claims are allowed.

By this Amendment, claims 2, 4, 11 and 40 have been amended, claim 10 has been cancelled and claim 41 has been added to incorporate all the subject matter in the cancelled claim 10. Accordingly, claims 2, 4, 6-9, 11, 35, 36, 40 and 41 are presented for further examination. No new matter has been added.

Claim Objections

Claim 2 was objected to because of a typographical error. Applicants wish to thank the Examiner for pointing out this error, and herein amend claim 2 to correct the error. Accordingly, Applicants respectfully request the Examiner to withdraw the patent objection.

Rejections under 35 USC §102

Claims 2, 4 and 6–10 and 40 stand rejected under 35 USC §102(b) as anticipated by, or in the alternative under 35 USC §103(a) as obvious over U.S. Patent No. 5,540,860 to Hosseini et al. alone or if necessary, in further view of the specification and examples of that reference.

Applicants respectfully submit that this rejection is untenable and should be withdrawn. The present invention is directed to solid composite particles having a core consisting essentially of surface oxidized copper power, cuprous oxide, copper hydroxide and combinations thereof and a shell consisting essentially of a copper pyrithione formed by reaction of pyrithione acid or a water-soluble salt of pyrithione with a portion of the copper in the core.

On the other hand, Hosseini et al. relates to a process for producing a gel-free dispersion or solution of copper pyrithione employing at least one surfactant. The working examples of Hosseini et al. relate to the preparation of copper pyrithione. There is no suggestion in Hosseini et al of a composite particle having a core consisting essentially of surface oxidized copper power, cuprous oxide, copper hydroxide and combinations thereof as recited in instant claims.

The Examiner stated in the office action that a composite having a core and shell as claimed in the present invention must be inherently present in the Hossein particles. Admittedly,

the Applicants's composite particles and the Hosseini's particles are produced by similar processes. But the Applicants' composite particles and Hosseini particles are made from different copper compounds with different properties, thus having totally different compositions.

Applicants' claimed composite particles are produced from *substantially insoluble* surface oxidized copper power, cuprous oxide, copper hydroxide and/or combinations thereof. (See amended claim 2 as supported by the disclosure contained in p. 5, lines 16-17) During the transchelation reaction, surface oxidized copper power, cuprous oxide, copper hydroxide exists as particles suspended in the reaction carrier as it is substantially insoluble. Under the reaction conditions of the present invention, some of the pyrithione anions from the soluble pyrithione salt or pyrithione acid chelate with metal copper on the surface of surface oxidized copper power, cuprous oxide, copper hydroxide, thus forming a composite particle with a core of copper, cuprous oxide or copper hydroxide and a shell of copper pyrithione, where the shell is chemically bound to the core at the shell/core interface. The structure of the composite particle formed is confirmed by microscopic analysis and is shown at Fig. 2 of the present application.

On the other hand, the Hosseini particles are made from a copper salt that is *soluble in the reaction carrier*. (see Hosseini, col. 2, lines 59-60). Since the copper salt disclosed in Hosseini is soluble, in the reaction mixture, it exists as anions and cations separated by numerous solvent molecules, ions from the pyrithione salt and/or surfactants. Under the conditions of the Hosseini process, copper pyrithione is formed from copper cations and pyrithione anions. When copper pyrithione precipitates out, it is highly unlikely that the copper pyrithione will somehow capture both anions and cations of the copper salt from the reaction mixture at the same time and form a composite with the copper salt as the core. Most likely, the anions and cations of the copper salt stay in the reaction mixture and are removed when the precipitate (copper pyrithione) is filtered and washed with plenty amount of solvent. Therefore, by utilizing soluble copper salts disclosed in Hosseini as the substrate in the chelation reaction, no composite particles are formed having a shell and core, but rather simply particles of copper pyrithione. Accordingly, Hosseini does not disclose the instantly claimed composite particles, inherently or otherwise, or suggest such composite particles.

The Hosseini reference specifically teaches the use of *a soluble* copper salt to prepare copper pyrithione. A person of ordinary skill in the art will appreciate that the purpose of this

limitation is to ensure a complete removal of the soluble copper salt in the later work up process. Thus in light of this teaching, a person of ordinary skill in the art at the time of the invention would not be motivated or led to substitute *the soluble* copper salts disclosed in Hosseini with a *substantially insoluble* surface oxidized copper power, cuprous oxide, copper hydroxide and combinations thereof as claimed in the present application. Accordingly, Hosseini does not disclose or suggest to one of ordinary skill in the art how to make or produce a biocidal composition comprising composite particles having a shell and a core, particularly particles wherein the core consists essentially of surface oxidized copper powder, cuprous oxide, copper hydroxide, and combinations thereof.

Since Hosseini et al. does not teach or suggest the instantly claimed biocidal composition, the outstanding claim rejection based upon this reference is untenable and should be withdrawn.

Claims 2, 4 and 6–11 and 40 are rejected under 35 USC 103(a) as being unpatentable over Hosseini et al. alone or in view of the specification and U.S. Patent No. 5,342,437 to Gavin et al.

As discussed in detail above, there is no disclosure or suggestion in Hosseini of a composition comprising composite particles having a core consisting essentially of surface oxidized copper, cuprous oxide or copper hydroxide and a shell consisting essentially of copper pyrithione. Moreover, as the Examiner admitted in the Office Action, Hosseini does not disclose a fatty acid coating of the shell.

Gavin et al. relate generally to paints and paint bases and admittedly disclose the incorporation of fatty acids into pyrithione-containing paint compositions in order to avoid gelation. However, Gavin et al. do not teach or suggest composite particles of any kind, much less of composite particles coated with a fatty acid as claimed in instant claims 41 and 11.

The rejection based on the combination of these reference is untenable as the result sought to be achieved by the combination of the references does not disclose or suggest a biocidal composition comprising composite particles containing a shell and core, as claimed in the instant application. Specifically, even if a person skilled in the art did utilize a fatty acid in the Hosseini process as suggested by the Examiner, the particles formed would be simple copper pyrithione coated with a fatty acid, which is completely different from the composite particles in the instant claims. Accordingly, when viewed singly or in combination, neither reference

suggests composite particles of the instantly claimed invention. Accordingly, the rejection of the instant claims based upon that combination is believed to be untenable and should be withdrawn.

Rejections under 35 USC §103

Claims 2, 4, 6–10, 35, 36 and 40 are rejected under 35 USC §103(a) as being unpatentable over Hosseini et al. alone or in view of the specification (e.g. page 7, figures and examples) and examples (e.g. example 1) to demonstrate inherency and Kappock et al. U.S. Patent No. 5,518,774 (5/96). Applicants respectfully submit that this rejection is untenable and should be withdrawn.

The Hosseini reference which is discussed in more detail above, teaches gel free copper pyrithione particles formed by reacting soluble pyrithione salt and soluble copper salt in an ion-exchange reaction.

Kappock et al. admittedly teaches transchelation of copper oxide with a soluble pyrithione salt to produce an insoluble pyrithione salt such as copper pyrithione in a formulated paint composition to provide in-can preservation during storage of the paint. (See col. 3, lines 12-32) This disclosure does not teach or suggest copper pyrithione in a composite particle having a core consisting essentially of surface-oxidized copper powder, cuprous oxide, copper hydroxide and combinations thereof.

Even though both the Hosseini reference and the Kappock reference teach the formation of copper pyrithione from a soluble pyrithione salt and a copper containing compound. The Hosseini tranchelation process is very different from the Kappock transchelation process. In Hosseini process, copper pyrithione is produced in a matter of a few hours. The reaction mixtures are just copper salt, soluble pyrithione salt, and one or more surfactants. On the other hand, in the Kappock process, copper pyrithione is made in a matter of days or months during the storage life of the paint. And the reaction mixtures are soluble pyrithione salt, copper salt, together with resins and many other ingredients of the paint.

In addition, the Kappock reference does not teach any advantages associated with utilizing copper pyrithione in the paint compositions. It is known in the art that copper

pyrihtione has "dry-film" potency. The excellent "in-can" preservation property of the Kappock compositions is attributable to the presence of soluble pyrithione in the composition, not copper oxide. Accordingly, a person skilled in the art would not be motivated or led to modify the Hosseini particles in view of the teaching of Kappock or to combine the teachings of Hosseini et al. and Kappock et al..

Hosseini et al. and Kappock et al. do not teach or suggest the biocidal composition of the present invention. This is not surmise, but rather a conclusion based on the specific teachings of the references themselves. Accordingly, Applicants respectfully submit that this rejection is untenable and should be withdrawn.

In summary, Applicants submit that none of the references, alone or in combination, anticipate or make obvious the invention as presently claimed and that the application is now in condition for allowance. Therefore, Applicants respectfully request consideration of the amended claims, and an early receipt of a Notice of Allowance of the claims as amended.

CONCLUSION

Applicants respectfully request consideration of the claims in their amended form, and an early receipt of a Notice of Allowance thereof. Any fees due with this Reply may be charged to our Deposit Account No. 23-1665 under Customer Number 27267.

Respectfully submitted,

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